

# Committee on Resources

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## Witness Testimony

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Testimony of

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Alabama Power Company

Before the Subcommittee on Water and Power Resources

on Defferred Maintenance at Facilities Generating Power for the Southeastern Power Administration (SEPA)

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### I. INTRODUCTION

My name is Earl B. Parsons, Jr. and I am Alabama Power Company's Senior Vice President for Fossil and Hydro Generation, Power Generation Services and Fuels. Alabama Power Company is a subsidiary of The Southern Company, which also owns Georgia Power Company, Gulf Power Company, Mississippi Power Company, and Savannah Electric and Power Company. I have over 35 years of experience with The Southern Company and have held executive positions over power generation functions for the past 18 years. In my current position, I am responsible for the planning, design, construction, maintenance, and operation of the fossil-fired and hydroelectric generation of Alabama Power Company.

I am honored to have the opportunity to appear before the subcommittee to discuss the deferred maintenance issues concerning the United States Army Corps of Engineers' hydroelectric facilities in the Southeast. As a strong proponent of hydropower, I appreciate the time and effort the subcommittee is spending on investigating how best to utilize the hydropower facilities currently owned and operated by the Federal government.

The purpose of my testimony is to provide the subcommittee with an example of how an investorowned utility, that has a number of hydroelectric projects in the Southeast, operates and maintains these facilities, and to contrast that privately-run program with the program operated by the Corps. Both Alabama Power Company and Georgia Power Company own and operate significant hydroelectric facilities. However, since I am most familiar with the operations of Alabama Power Company's hydroelectric facilities, I will concentrate on these facilities in my testimony. I believe that Alabama Power Company is fairly typical of most investor-owned utilities with regard to its hydro maintenance program, and that an overview of Alabama Power Company's maintenance program will provide evidence of how a governmentowned facility would be operated and maintained if it were privatized. As the subcommittee examines operating and maintenance programs of utilities such as Alabama Power Company, and compares these programs with the shortcomings of programs at governmentowned projects, I am sure the subcommittee will understand why I believe that privatization would improve the maintenance and operations of these facilities.

### II. ALABAMA POWER COMPANY'S HYDROELECTRIC SYSTEM

Alabama Power Company has a long history of owning and operating hydroelectric generation. The Company constructed six dams prior to 1930. Seven additional dams were constructed in the 1960's, and its newest facility was built in 1983. The Company has hydro facilities on three major river systems (the Coosa,

Tallapoosa and Warrior Rivers) that provide approximately 1,600 megawatts of generation capacity. This hydroelectric capacity is approximately 13 percent of the Company's total capacity and provides its customers with efficient and low-cost, peaking power. Alabama Power Company also maintains and operates these facilities in a manner that is consistent with other water resource needs of the projects. In this regard, these 14 hydro developments also provide some 155,547 acres of reservoir and 3,132 miles of shoreline for recreational opportunities for the general public.

### III. ALABAMA POWER COMPANY'S MAINTENANCE PROGRAM GOALS

Alabama Power Company's hydroelectric maintenance program is based on two fundamental goals. The first goal is to maximize each unit's efficiency and availability. If a unit is not properly maintained, its operations will become less efficient, resulting in decreased kilowatt-hours of energy being generated from the available water. Neglecting maintenance could also lead to an unscheduled outage at the facility, which forces the use of more expensive generating resources. The Company's maintenance program is designed to prevent such outages and to maximize the energy potential of the water resource.

The second (and sometimes competing) goal of our maintenance program is to minimize the cost of maintaining our projects. As the electric industry becomes more competitive, Alabama Power Company is constantly looking for ways to cut costs. At the same time, we must also ensure that our generating facilities are available so that service to our customers is not compromised. Simply put, the Company must devote whatever resources are necessary to ensure that its hydro projects meet operational requirements. In this regard, new technologies are continually being developed that can result in operational efficiencies, and we are constantly evaluating these technological improvements to determine whether the benefits are worth the costs. Where the benefits do outweigh the costs, the Company is committed to making the capital improvements needed to enhance the operation of its hydroelectric facilities. By balancing the interests of maximizing unit efficiency and availability against operation and maintenance costs, the Company ensures the economic, safe and reliable operation of its hydro projects.

### IV. ALABAMA POWER COMPANY'S WORK FORCE

Labor costs represent a significant percentage of Alabama Power Company's hydroelectric maintenance budget, and work force management is an essential component of its maintenance program. We have well-trained, highly-skilled and highly-motivated employees who take a personal interest in the success of our hydro operations. The Company's supervisory staff is comprised of experienced individuals who have special training in technical and management disciplines and substantial experience in hydro operations. The balance of our work force is drawn from a pool of employees who have strong backgrounds in power plant construction and maintenance. Much of this work force is comprised of multicraft "Hydro Journeymen", which includes individuals with electrical, mechanical and operational skills. One reason for the success and productivity of these "Hydro Journeymen" is the Company's extensive training program. In 1995, we provided each employee in this classification with an average of 120 hours of technical training. This training was largely developed internally, using the expertise, knowledge and experience of employees throughout the Company's hydro program.

The employees who participate in hydro maintenance are highly motivated for at least two reasons. First, they are acutely aware of the importance of hydro in our generation mix and understand that the low-cost energy produced by these facilities will play an important role in ensuring that the Company thrives in today's competitive world. Second, the Company has a compensation system that includes a pay for performance incentive program. Our employees know that the better job they do, the higher their income

will be.

## V. ALABAMA POWER COMPANY'S PLANT OPERATIONS

Based on the experience the Company has in operating hydroelectric facilities, we know that only by operating these projects very wisely can we reduce the number of unexpected plant outages. Unexpected outages typically result in much higher costs to system operations than scheduled plant outages for maintenance. Accordingly, the Company makes every effort to avoid unplanned outages.

The Company's operators and maintenance personnel have available to them a significant amount of data regarding the units. For example, they have instruments that constantly monitor such variables as the vibration and temperature of a unit. If the temperature gets too high or there is too much vibration, an operator can adjust the flow of water through the turbine in order to minimize the stress on the unit and improve its efficiency. Making these types of adjustments reduces the amount of maintenance required and helps reduce forced outages at the plant. It also provides the plant operator with information that is helpful in planning maintenance activity at future scheduled outages.

In the event of an operational problem, Alabama Power Company can bring to the project the necessary personnel needed to resolve the problem. Such personnel include hydro plant crews, fossil plant crews, power generation and engineering support groups, power delivery substation maintenance crews, licensing experts and regulatory compliance support groups. In addition, we are able to call upon the expertise of Georgia Power Company and the Southern electric system's engineering and technical support company, Southern Company Services, Inc. With Alabama Power Company and Georgia Power Company having a combined total of approximately 2600 megawatts of hydro capacity - - an amount roughly equivalent to the capacity marketed by the Southeastern Power Administration (SEPA) in its Georgia-Alabama-South Carolina system - - our projects have a wide range of expertise available at a moment's notice. As a result, we are often able to resolve operational problems without having to take units offline.

Another significant factor in the operation of the Company's projects that can impact maintenance requirements is the operation of generating units at "efficient gates" or "best gates". This method of operation is contrasted with "full gate" operation in which the maximum amount of water is allowed to pass through each turbine. While "full gate" operations yield more energy and increases the maximum generating level for a short time period, the project cannot be operated for as long as it could with a "best gate" setting because the available water supply is depleted sooner. By operating our units at "best gate", we maximize the energy that can be generated from the limited quantity of water available. This gate setting, which is determined specifically for each unit, produces the maximum horsepower to the generator shaft with the smallest amount of water. Operating the plants in this fashion reduces the wear and tear on the units associated with vibrations, blade cavitation and temperature rises; maximizes the life expectancy of all plant equipment; and reduces forced outages.

## VI. ALABAMA POWER COMPANY'S MAINTENANCE PLANNING

During normal plant operations, the Company constantly performs routine maintenance at the projects. This begins with daily inspections of the projects. For these daily inspections, the Company has developed maintenance procedures that incorporate an extensive checklist of potential problem areas. For electrical and mechanical systems and components that do not require daily inspection, other checklists have been developed for use on a weekly or monthly basis. These procedures and associated checklists serve two functions. First, they are used to evaluate the plant's operating conditions and to detect any system or

component that may be showing signs of wear or need of attention. As maintenance issues are discovered, these problems are either resolved during normal project operations or are addressed during the next scheduled outage. Second, these procedures contain numerous action items that serve preventive or predictive maintenance purposes. For example, plant personnel clean and lubricate various systems and components in order to avoid significant operational problems that could result in an unscheduled outage. By performing this routine maintenance during plant operations, we are able to observe and correct small problems before they become big and expensive problems and to keep units operating at high levels of efficiency.

Alabama Power Company also pursues a scheduled maintenance program that matches the benefits of hydro power resources with the Company's peak demand needs. The peak demands on Alabama Power Company's electric system occur during the summer and winter months. During these periods, the performance of our hydroelectric facilities is critical. In order to ensure the full and efficient operation of these projects during these peak periods, projects that need to receive scheduled maintenance are removed from service during off-peak periods in the spring or fall. For most projects, only one outage a year is necessary. Typically, these outages are conducted during the fall because there is usually lower flow in the rivers in the fall than during the spring.

The outage for each project is scheduled and coordinated by Alabama Power Company's Reservoir Management group to ensure that not too many units are offline at any one time. To determine when an outage is to occur, Reservoir Management uses a computer system developed in-house called the Hydro Optimization Management System ("HOMS"). HOMS allows centralized and coordinated scheduling, management, and operations of the Company's 14 hydroelectric plants and the hydro generation available from the Corps. Using real-time, telemetered data of rainfall and inflow in the watersheds for the Company's reservoirs, HOMS accurately predicts the water flows that each hydro project can expect. This allows the Company to schedule outages in a way that maximizes the use of the available water. Furthermore, it provides the information needed to lower the reservoir a few days before an outage and prevent water spillage during the outage.

A typical outage for an Alabama Power Company hydro facility is approximately 7 to 14 days. Because electric loads constantly change, river conditions change as the weather changes, and our hydroelectric capacity is among the lowest cost sources of generation on our system, we seek to minimize the amount of time these units are offline. Accordingly, the Company's outage crews usually work around the clock to complete maintenance activities as quickly as possible. To assist these crews in performing their outage work, the Company has developed another set of standard criteria to ensure that each unit is thoroughly inspected and that all preventive and predictive maintenance activities are accomplished as efficiently as possible. In addition, these crews address the various maintenance items identified during the routine inspections described above. At times, substantial capital improvements are required to replace equipment in order to allow continued efficient operations. For these types of maintenance items, Alabama Power Company typically makes budgetary plans as far as ten years in advance to ensure that these capital expenditures are properly funded. Through this plant rehabilitation program, we are constantly conducting studies designed to identify longterm needs and to prioritize those needs so that we can manage both budget impacts and work loads. Because these procedures are followed at all of our facilities, our hydro maintenance program is consistent and very effective. Because Alabama Power Company has been dedicated to properly maintaining its hydro projects, these projects continue to be operated efficiently and provide significant benefits for the Company's customers. The success of the Company's preventive maintenance program is demonstrated by the fact that generating unit availability for the past five years has

averaged above 96 percent. During this time period, the Company has experienced a minimal amount of unscheduled maintenance outages. Moreover, the cost of maintaining these projects is under control. The high availability factors and low maintenance costs are two of the reasons why Alabama Power Company has some of the lowest electric rates in the country. In short, the Company is meeting one of its major responsibilities as a steward of the valuable natural resources in Alabama by operating its hydro facilities as efficiently and cost effectively as possible.

## VII. THE SEPA CONTRACTS WITH THE SOUTHERN COMPANIES

Alabama Power Company has dealt with the Southeastern Power Administration ("SEPA") since 1970 under various contracts that provided for the integration of SEPA's generating resources with the Company's resources to ensure the SEPA capacity and energy could be delivered to their preference customers in a reliable manner. In 1985, Alabama Power Company, Georgia Power Company, Gulf Power Company and Mississippi Power Company, all of which are operating subsidiaries of The Southern Company, entered into new contracts with SEPA. Under these contracts (which have run their term and are continuing on a monthly basis), the Southern Companies provide transmission and other services to SEPA and its preference customers. Many aspects of the existing arrangements are now unsatisfactory to the Southern Companies, and the parties are currently negotiating to develop a replacement agreement. The Southern Companies' dissatisfaction with the existing arrangements stems in part from the level (or lack) of compensation for transmission and associated ancillary services that are being provided and, thus, are not an issue for this hearing. Other matters, however, bear directly on the operation and maintenance issues that are the subject of this hearing and confirm that the current approach to operating and maintaining the SEPA projects is fundamentally flawed.

Under the existing contracts, SEPA makes a portion of the capacity it markets available to the Southern Companies, which, in turn, give the preference customers in the Southern electric system control area a credit on their bills to reflect such capacity. This allows the SEPA capacity to be integrated with the total generating capacity of the Southern electric system, and also gives the maximum possible benefit of the SEPA capacity to the preference customers through the billing process. The Southern Companies currently provide the preference customers in their control area with a monthly billing credit of 1296 megawatts. For its part, SEPA is required to make available approximately 1448 megawatts of capacity and energy to the Southern Companies, which reflects the 1296 megawatts of billing credits, and 152 megawatts that Alabama Electric Cooperative, Inc. (AEC) and South Mississippi Electric Power Association (SMEPA) may schedule for delivery from the Southern electric system control area. The contracts also obligate SEPA to hold 237 megawatts of capacity in reserve. This level of reserves is similar to that maintained by investor-owned utilities, such as the Southern Companies, and was to be held in reserve to ensure that at least 1448 megawatts of capacity would be available to the Southern electric system to serve SEPA's preference customers. Over the years since the contracts were developed, the SEPA projects have often failed to satisfy their capacity obligations. SEPA frequently does not have its reserve capacity available to support the capacity allocated to the preference customers. Indeed, as Attachment 1 illustrates, SEPA often does not even make available the 1448 megawatts that the Southern Companies are providing to the preference customers. The data shown on Attachment 1 was extracted from the weekly Project Declaration Reports provided by the Corps. It bears emphasizing that the Corps is responsible for and has the final authority to declare what capacity can be provided from each of its hydroelectric projects. The Southern Companies have the right to call on this capacity, but only to the extent that the Corps declares the capacity is available for operation. If a utility fails to provide sufficient capacity to serve its load, then it should either purchase power or reduce its load to an amount it can support. SEPA has largely avoided this issue because under the

existing arrangements, the Southern Companies must provide the capacity required to serve the preference customers' loads when SEPA's capacity is unavailable. The Southern Companies must also give full capacity billing credits to the preference customers for the month in which such interruption or reduction in SEPA's capacity occurs, plus an additional 30-day period. It is only after the expiration of this period - potentially as long as 60 days - that the Southern Companies can reduce the billing credits to reflect the amount of SEPA capacity that is actually being made available. This aspect of the SEPA contracts essentially amounts to the provision of backup power - - a valuable service for which the Southern Companies receive no compensation.

The Southern Companies believe that SEPA's failure to satisfy its capacity commitments, as clearly shown in Attachment 1, can be traced to several causes. In an effort to meet SEPA's capacity obligations, the Corps, as operator of this capacity, often operates the units at "full gate". As discussed above, such operations are not efficient and tend to increase the forced outages and required maintenance of the projects. Also, the Corps has not been able to effectively establish a long-term maintenance program, such as that of Alabama Power Company and other investor-owned utilities. This inability to establish and execute a long-term maintenance program may be impacted by the annual appropriations process with which the Corps has to cope. We suspect that the frequency of outages and the extended duration of outages being experienced at the SEPA projects are (at least in part) the results of inadequate maintenance. These operation and maintenance issues have not seriously affected SEPA in the past because the Southern Companies have provided backup power at no charge. This has allowed the preference customers to continue receiving full billing credits for SEPA capacity allocations, even when SEPA has not had adequate capacity to meet these obligations. This arrangement will soon end and the new arrangement will require SEPA to either purchase replacement power or face a reduction in billing credits provided to the preference customers whenever the hydroelectric capacity is unavailable. The cost associated with a failure to properly operate and maintain these projects must be borne by SEPA or the preference customers and not by other customers in the area.

## VIII. SEPA'S PERFORMANCE

It is no secret that the Corps has experienced very lengthy outages at several of its hydroelectric plants in the Southeast. Our primary source of information on these outages comes from the declarations made by the Corps of capacity available to the Southern Companies to meet the requirements of SEPA's contracts discussed above. Attachment 2 summarizes this information for each of the SEPA projects and shows the lengthy outages experienced at the Allatoona, R. F. Henry and Millers Ferry Projects. As a comparison, the same information for Alabama Power Company's projects are also shown on the attachment. We understand that Miller's Ferry has had one unit out of service for over four years and two other units at reduced capacity levels for this same period. We also understand that R. F. Henry has had two units which were each out of service for over three years. All of this occurred within the last six years. I do not know the detailed causes of these outages. The outages could be a result of unit aging, poor design or installation, but it is more likely that these outages are a result of the lack of an effective long-term maintenance program. The ages of the SEPA units are not that different from the ages of Alabama Power Company's units and the design can be expected to be similar.

As mentioned earlier, the performance of the SEPA projects appears to be largely the result of the Corps not being able to establish an adequate long-term maintenance program. This is exacerbated because the Corps operates the units at "full gate" rather than "best gate" on a routine basis in an attempt (often unsuccessful) to meet the SEPA capacity obligations. Both of these situations appear to have significantly degraded the Corps' projects, and have led to the Corps being required to react to immediate needs for repairs as best it can. One impact of these problems is an increase in the number of forced outages as shown on Attachment

3, which compares the availability rates for the SEPA projects with the availability rates for Alabama Power Company's hydroelectric units. While Alabama Power Company's projects have demonstrated availabilities consistently in the 95 to 97 percent range, SEPA's projects have demonstrated availabilities that have ranged from approximately 90 percent down to 81 percent, and average in the mid 80's.

## IX. CONCLUSIONS

Even though the information we have on the operation of SEPA's projects is limited, the data I have presented clearly illustrates the declining performance of these projects. There may be many reasons for this deterioration. I believe two of these reasons are the Corps' inability to establish an adequate long-term maintenance program and the Corps operation of the units at "full gate" to meet SEPA's contractual requirements. The first of these reasons could be addressed by streamlining the appropriations process and establishing a long-term funding process to match the need for long-term plans to refurbish the hydroelectric units. This may be very difficult for the Federal government to accomplish. At this time, there is no linkage between the revenues being received by SEPA for their power sales and the funds the Corps receives for maintaining the hydroelectric facilities, and there does not appear to be any direct consequences for not properly maintaining the facilities. The conflict between operating the units at "full gate" to meet SEPA's desire to maximize capacity allocations to its preference customers, and operating at "best gate", which is more efficient in the use of the available water and in reducing forced outages, needs to be resolved by adopting a realistic and reasonable capacity between the Corps and SEPA.

Even if both of the above issues are addressed as discussed, it is not likely that the Corps will achieve the same levels of efficiencies as Alabama Power Company and other investor-owned utilities. In the end, the investor-owned utilities have incentives to achieve efficiencies in the use of their resources that spur higher levels of performance. These incentives are clearly recognized at all levels in Alabama Power Company and cause our personnel to clearly focus on and achieve high performance levels. This will be very difficult for the Corps to match, especially since it has to balance several objectives at once. The Corps has to be concerned with navigation and flood control as well as power generation. Available funds, maintenance personnel, and management's attention have to be continuously juggled between the conflicting objectives in these areas. As previously discussed, we have jointly operated two hydroelectric facilities with the Corps for many years. The Holt and Bankhead hydroelectric projects are located on the Corps of Engineers' reservoirs on the Warrior River, and were constructed by the Corps for flood control and navigational purposes. The Corps owns and operates these dams and the associated navigational locks. Alabama Power Company owns and operates the powerhouses and generating equipment. As a result of this dual ownership, close cooperation between Alabama Power Company and the Corps is essential. To this end, the Company has for over 30 years coordinated its power operations with the Corps to ensure that its flood control and navigation purposes are met. Moreover, during outages at Holt and Bankhead, the Company coordinates closely with the Corps so that the Corps will be prepared to modify its operation of the dams as necessary. To assist the Corps in this regard, we share our calculations and predictions of potential changes in river flow conditions, as determined by HOMS. We know the Corps can perform its duties, in this type of arrangement, in a highly competent manner. However, we doubt that the Corps with its conflicting objectives, can match the performance of an investor-owned utility in the operation of hydroelectric facilities, because of the investor-owned utility's clear focus on power generation and the incentive to thrive in an increasingly competitive industry.

There are many reasons that the Federal government should not be in the power generation business. Among these are: (i) the lack of clear incentives to be efficient, (ii) the use of federal funds and other subsidies distort the market for electricity and create market inefficiencies, (iii) the sale of power at below-market

rates encourages inefficient consumption, and (iv) in the case of the Federal Power Marketing Agencies (like SEPA), the unfairness of all of the taxpayers subsidizing projects that benefit a relatively small number of preference customers. For all of the above reasons, I believe the correct solution is to privatize the power generating facilities being marketed by SEPA.

There have been other proposals recently to deal with the problems facing the Federal Power Marketing Administrations. The Clinton Administration has proposed allowing the preference customers to directly fund the improvements needed at the Federal facilities involved in exchange for permanent capacity allocations and lifetime contracts. The Tennessee Valley Authority has proposed taking over the operation of several of those facilities for the preference customers. These proposals appear to be aimed at locking in the subsidies the preference customers have been enjoying and do nothing to address the market distortion that exists or to provide the incentives needed to achieve efficient operations. These issues will only be addressed by moving to privatize these facilities.

Again, I would like to thank you for this opportunity to address the maintenance issues at the SEPA projects and I appreciate your efforts in addressing these issues. I would be happy to answer any questions the Committee members may have.

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